STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

A STUDY OF CUTTHROAT-STEELHEAD IN ALASKA

by

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ABSTRACT

This report covers the second year of study on the development of techniques for management and enhancement of the anadromous cutthroat trout, Salmo clarki Richardson, in Southeast Alaska.

Work during the reporting period included. gathering information for a cutthroat management and enhancement plan for Southeast Alaska and the study of the intra and inter stream movement of anadromous cutthroat trout.

Information gathered to date for the cutthroat management and enhancement plan includes a statement of need for the plan followed by a summary of the life histories of the anadromous and resident cutthroat trout of Southeast Alaska. Also included is a section listing the known anadromous cutthroat systems in Southeast Alaska. This section lists the known resident cutthroat lakes and streams found throughout Southeast.

Information is presented on the management of cutthroat in Southeast Alaska. This section traces past management and regulation history of cutthroat from the mid-1940's to the present time and presents guidelines for future management prescriptions.

The final section is on cutthroat research. A summary of research findings conducted to date in Southeast Alaska is presented and areas where research will be necessary in future years are identified. Four appendixes are attached to the cutthroat plan. Appendix A consists of a selected bibliography of references dealing with the coastal cutthroat throughout its range from northern California to Alaska. References covering research, management and enhancement can be found in this Appendix. Appendix B contains the listing of the known anadromous cutthroat systems in Southeast Alaska. Appendix C contains the listing of the known resident cutthroat systems throughout Southeast Alaska and Appendix D lists the "Quality" cutthroat watersheds found in this area.

The intra and inter stream movements of anadromous cutthroat were studied at seven non-lake systems and one lake system in the Petersburg area. Cutthroat from these systems were captured, mostly on hook and line, measured and tagged with color coded "Floy" tags. The cutthroat were then released at point of capture. During the summer of 1977, a total of 204 cutthroat were tagged. Recovery of tagged fish was accomplished by sampling of each stream in the fall of 1977 and by contacting anglers fishing for cutthroat. A total of 42 tagged cutthroat were recaptured. Tagged cutthroat showed an upstream movement within the same system or no movement at all. Only two cutthroat tagged at Big Creek, Mitkof Island, demonstrated any long range movements away from the tagging site. One cutthroat was recaptured in Petersburg Creek while the other was taken in Blind Slough. Tag returns do indicate some degree of movement between systems within a small geographic area; however, this movement may not be as frequent as had been suspected based on work done at Petersburg Creek.

BACKGROUND

Life history research on the sea-run cutthroat trout, at Petersburg Creek from 1971 through 1975 provided many answers about sea-run cutthroat in a typical lake-stream system in Southeast Alaska.

This life history research determined that the annual runs of anadromous cutthroat are not large for any given stream system and are comprised of fish in the four to nine year age classes. Annual fall runs of cutthroat were found to be made up of both immature and mature fish, with mature fish accounting for no more than 60% of the population. This low number of spawners tends to limit the annual egg deposition in the Petersburg Creek system.

A steady decline in the numbers of anadromous cutthroat was noted during the years of study at Petersburg Creek. This decline was determined to be caused mostly by the annual harvest of 300 or more cutthroat by sport anglers (Jones, 1977). Studies at Lake Eva (Armstrong, 1971), a stream only lightly fished, showed no marked fluctuations from year to year in the sea-run cutthroat population.

Studies at Petersburg Creek showed that the preferred rearing habitat for anadromous cutthroat is quite limited in any specific stream or tributary and may account for the low total populations of cutthroat in the streams of Southeast Alaska (Jones, 1973).

Comprehensive data on the majority of the cutthroat systems in Southeast Alaska is not presently available. Angler harvest of sea-run cutthroat has shown a steady increase throughout Southeast Alaska. This harvest is presently concentrated around population centers and in the better known streams within easy reach of population centers. With improved access due to logging road expansion and the development of mining, the fishing pressure will expand to areas where only light or no angling occurred 10 to 15 years ago. Increased fishing pressure on some populations will make it hard to maintain sizeable populations. Present bag limits are too liberal for the

exploited populations and probably adequate in those areas not receiving much angling pressure. More restrictive bag limits may be necessary on a stream by stream basis in order to maintain a viable population.

Studies of the movement of anadromous cutthroat from stream to stream and within a stream have shown that management of a sea-run population of cutthroat may best be accomplished by managing a small area as one unit. Cutthroat found in an area of roughly 64 square kilometers are what may be considered an area population. Movement will occur within this region but very little straying will occur to adjacent areas. The number of streams with anadromous lakes in each area will more or less determine the cutthroat population within each geographic area.

Completion of the Crystal Lake Hatchery at Petersburg in 1972 provided a new dimension to the management of sea-run cutthroat in Southeast Alaska. Crystal Lake Hatchery has the capability of raising sea-run cutthroat to the smolt size in one year and the capability of raising cutthroat to maturity at the hatchery. Attempts to locate and develop a brood stock of wild sea-run cutthroat have not been successful to date. Research and the development of capture techniques for obtaining a brood stock are continuing.

In order to define cutthroat management and research needs throughout Southeast Alaska a plan addressing all aspects of cutthroat biology must be written.

RECOMMENDATIONS

Management

1. Provide for a reduction in the cutthroat bag limit to four fish daily with a possession limit of two daily bag limits.

Studies of sea-run cutthroat at Lake Eva, (Armstrong, 1971) Petersburg Creek, (Jones, 1977) and Helm Creek (Baade, 1957) have shown that cutthroat populations are not large, usually numbering between 800 and 1,500 annually. The sport fishing mortality of approximately 300 cutthroat annually at Petersburg Creek is considered to be excessive and responsible for the declining adult run size. The bag limit prior to 1974 was 15 fish daily with 30 fish in possession. The bag limit was reduced to ten fish daily and 20 in possession starting with the 1975 season. Creel census work at Petersburg Creek in 1975 found that the reduction to ten fish daily had virtually no influence on angling mortality, as 309 cutthroat were caught and retained during the census period. When the bag limit was 15 fish, very few anglers caught and retained 15 fish daily. Most anglers killed between five and six cutthroat and either quit fishing or released any additional fish caught. Consequently, the reduction to ten fish daily did not influence the total harvest at Petersburg Creek in 1975. A bag reduction to four fish will not greatly affect angling patterns but will help maintain the existing sea-run cutthroat population in Southeast Alaska.

2. Continue gathering information for a cutthroat mangement and enhancement plan for Southeast Alaska.

The management or Phase I segment of the Southeast Alaska cutthroat plan is presented in this report. Completion of Phase II or the enhancement segment of the plan will provide a complete working manual from which future work on cutthroat will be based. At present, the enhancement of cutthroat will depend on the expansion of rearing facilities in Southeast Alaska.

3. Develop guidelines for the establishment of a brood stock of sea-run cutthroat.

The use of hatchery-reared cutthroat to enhance or create new fisheries for sea-run cutthroat has occurred throughout Oregon and Washington. These programs have had varying degrees of success. It is recommended that work be done on selecting a brood source for cutthroat and that these findings be turned over to the F.R.E.D. Division for action.

Research

1. Develop techniques for determining the harvest rates for sea-run cutthroat in Southeast Alaska.

Rate of sea-run cutthroat harvest from most systems throughout Southeast Alaska is not well known. Techniques need to be developed to determine the rate of harvest so that management districts may be set up.

2. Continue the gathering of background data on sea-run cutthroat streams in Southeast Alaska.

Completion of the cutthroat management and enhancement plan will require the gathering of large amounts of data on the many cutthroat systems throughout Southeast Alaska.

3. Develop techniques for the capture of lake dwelling cutthroat for population analysis.

The standing crop of cutthroat in lakes in Southeast Alaska is mostly unknown. Techniques need to be perfected whereby an accurate estimation can be made of the cutthroat population in any given lake. This information will be necessary to adequately manage many of the more heavily used lakes.

OBJECTIVES

1. Formulate and write Phase I of a management and enhancement plan for anadromous cutthroat in Southeast Alaska.

2. Investigate the intra and inter stream movement of cutthroat in selected stream systems in Southeast Alaska.

TECHNIQUES USED

Information was gathered for the cutthroat management plan for Southeast Alaska by:

1. Preparing a statement of need for writing a plan.

2. Preparing a summary of the life hstory of anadromous cutthroat in Southeast Alaska as determined from various studies.

3. Preparing a summary of all known anadromous cutthroat streams complete with maps where available.

4. Compiling information on the management of cutthroat with emphasis on regulation history, past, present and future.

5. Listing selected references on cutthroat with emphasis and management.

The intra and inter stream movement of cutthroat was determined by the following:

1. Cutthroat were captured by hook and line, baited minnow traps and other sampling gear.

2. Cutthroat captured were measured, tagged with color coded numbered "Floy" internal anchor tags and released at the point of capture.

3. Cutthroat were recaptured by hook and line sampling of the streams where they were tagged. Anglers were also contacted in the field and in the office.

4. Recapture information included point of recapture and length of fish. A summary was prepared on length of time between tagging and recapture, distance traveled and increase in lengths if any. Maps depicting cutthroat movement for each stream were prepared.

FINDINGS

Cutthroat Management Plan for Southeast Alaska

To effectively manage anadromous and resident cutthroat trout, Salmo clarki Richardson, in the streams, rivers and lakes of Southeast Alaska, a management and research plan establishing goals and objectives needs to be formulated.

At present there is insufficient and unconsolidated data on the many different populations of cutthroat in Southeast Alaska. This lack of data has placed the Department of Fish and Game in a position of not being able to adequately manage the area's cutthroat for the highest return to

the angler while maintaining viable populations of spawners. The development of this plan will bring together in an organized form all the known data on the cutthroat systems in Southeast Alaska. This plan will also consolidate all published and unpublished data on anadromous and resident coastal cutthroat trout. Once the data is collected, a working manual will be put together. This manual will help identify areas that require management and help establish priorities for future program needs.

The cutthroat plan will cover management and research needs of Southeast Alaska and may be expanded to cover the enhancement of cutthroat. Management prescriptions and research requirements presented in this plan will aid staff members in dealing with problems associated with cutthroat in Southeast Alaska. The working manual will be useful in presenting necessary regulatory proposals to local advisory committees and to the State Board of Fisheries. A plan for the artificial enhancement of cutthroat trout will be drafted as soon as rearing facilities become available for the production of cutthroat.

Phase I. Cutthroat Management and Research Plan

Literature Review

A search of various libraries is being conducted to secure listings on publications of the life history, habitat requirements, hatchery techniques and various management strategies for coastal cutthroat trout.

In addition, State and Federal agencies involved in coastal cutthroat management and research will be contacted so that a current file of ongoing management and research can be maintained. A bibliography of coastal cutthroat management, research and enhancement appear in Appendix A of this report.

Coastal Cutthroat Life History Summary

Southeast Alaska is home to two forms, or races, of coastal cutthroat trout, anadromous cutthroat and the resident or non-anadromous race. The dividing line between the two forms is indistinct. Both anadromous and nonanadromous cutthroat are found occupying the same stream or lake and just why one chooses to go to sea and the other to remain in fresh water is unknown.

Both forms of cutthroat follow much the same life history pattern. All cutthroat spawn in the spring, usually from late April to early June, with spawning occurring mostly at night in a variety of spawning sites. The most preferred spawning site is one near some form of escape cover just above or below a deep pool.

Coastal cutthroat in Southeast Alaska normally mature when they are five or six years of age and continue to spawn on an annual basis. Sea-run cutthroat do not normally live to be more than nine or ten years old. Resident cutthroat on the other hand have been recorded as old as 14 or 15 years. The stress of the transformation from fresh to salt and back to fresh water may be responsible for the short life span of sea-runs.

Young anadromous cutthroat emerge from the gravel during July and spend their first three or four years rearing in the stream, beaver pond, slough or lake. Upon reaching a size of ,approximately 200 millimeters they migrate to sea for the first time. Resident cutthroat emerge at the same time as anadromous cutthroat but then take up residency in their preferred habitat within the system. Young cutthroat of both forms prefer slow moving water as a rearing site. Beaver dams, sloughs, deep, slow pools and lake shores are preferred sites. Once cutthroat have reached approximately 200 mm they either go to sea or move out to the faster water areas of streams and away from the shallows of lakes.

In summary, Southeast Alaska is home to two forms of the coastal cutthroat. The anadromous form is found throughout the region and is more abundant in areas containing anadromous lakes or large rivers. The anadromous cutthroat goes to sea for the first time at an age of three or four when it has attained a length of approximately 200 mm. Time at sea varies for individual fish and may range from a few days to over 100 days with the average being 80 days (Jones, 1977). Sea-run cutthroat. reach maturity at an age of five or six and live to be nine or ten.

The resident form of the coastal cutthroat found in Southeast Alaska resides in a wide variety of types of habitat throughout the region. The resident cutthroat is most often found in lakes and streams blocked to anadromous fish migrations but are also found residing in anadromous systems. Some anadromous cutthroat populations may in fact be the result of resident populations dropping over an impassable falls into the lower stream areas. Resident cutthroat differ little from their sea-going counterparts in time of sexual maturity and habitat preference. Resident cutthroat do attain an older age (15 years) than sea-runs and are also the largest with individuals topping 3.6 kilograms. Both the anadromous and the resident forms appear to require an overwintering site in fresh water. This site may be a lake, beaver dam, deep water slough, or deep pools within the stream proper. It has not been recorded that cutthroat were spending the winter in salt water as is usually the case in Western Washington and Southern British Columbia.

Southeast Alaska Sea-Run Cutthroat Systems

Southeast Alaska contains approximately 2,000 streams that are classified as anadromous fish streams. Of this total, 85 plus stream systems are known to contain runs of anadromous cutthroat. A known anadromous cutthroat stream is defined here as a system that contains an overwintering population of sea-run cutthroat and has been confirmed by on-t e-ground surveys by various investigators.

The known anadromous cutthroat streams are distributed from Yakutat to Dixon Entrance with the majority occurring south of Frederick Sound.

A large number of streams throughout Southeast Alaska are host to sea-run cutthroat for a short period of time each year. Many of these systems are short with impassable barrier falls located a short distance upstream. Sea-run cutthroat are found in the lower stream and inter tidal zone mostly during the salmon runs in July through September. These systems

are not classified as sea-run cutthroat systems as the cutthroat found there are only on a feeding sojourn from other areas. To list these systems where sea-run cutthroat are found at any time would entail the listing of 500-600 streams. For the purpose of this plan, streams that do not contain outstanding qualities that would benefit the resource manager will be eliminated from the listings. A summary of the sea-run cutthroat systems in Southeast Alaska can be found in Appendix B of this report.

Southeast Alaska Resident Cutthroat Systems

Southeast Alaska contains over 200 lakes and associated stream systems many of which are home to resident cutthroat. Many of these lake systems contain impassable falls in their outlet streams so the cutthroat are true residents Others do not have impassable barrier falls and the resident cutthroat share their habitat with various anadromous species. Many of the land locked resident cutthroat populations provide some of the finest trout angling in Southeast Alaska. A summary of the surveyed resident cutthroat systems appears in Appendix C of this report.

Cutthroat Management in Southeas k

Anadromous Cutthroat:

Anadromous cutthroat numbers in many stream systems today are considerably less than they were a few short years ago. This decline has been caused by a number of factors.

Sea-run cutthroat habitat throughout Southeast Alaska has not been altered by man to any great extent. Local populations have been probably over fished and depleted; however, the overriding probable cause for the decline in anadromous cutthroat numbers has been the over fishing of the various salmon species. Rearing cutthroat depend to a large extent on salmon eggs and young for a food source. It is also suspected that without the large numbers of salmon to enrich the stream system, the basic productivity of the system is less and therefore not able to support as large a cutthroat population as occurred in the past.

Resident Cutthroat:

Resident cutthroat numbers thoughout Southeast Alaska have remained at a fairly constant level for many years. Local exceptions to this have been noted near population centers; however, on the whole their numbers appear to be quite good. The best populations of resident cutthroat in Southeast Alaska occur in the larger lakes of the region. The very size of the lakes together with their general lack of easy access has limited the fishing effort on most waters.

Management of cutthroat in Southeast Alaska began with the enactment of the first bag and possession limits in the mid-1940's. At this time the limit was 20 trout or 15 pounds and 1 fish. Possession limit was two daily bag limits. This bag limit remained in effect until the mid-1950's when the

wording of the law was changed to drop the poundage limit. The new law read that the limit was 20 trout per day, of which no more than three would exceed 20 inches in length. This had very little affect on the harvest of cutthroat as Southeast Alaska cutthroat rarely exceed 20 inches.

During the early days of management in Alaska, the numbers of anglers were small and their impact on cutthroat were not too significant. After Alaska achieved statehood in 1959, the first regulations issued were not greatly different than those in effect during territorial days. The trout limit was reduced to 15 fish daily of which no more than three could exceed 20 inches in length.

Possession limit remained at two daily bag limits. By 1975 it became apparent that increasing numbers of anglers were capable of over harvesting the native trout populations if allowed 15 fish daily. Starting with the 1975 season the bag limit was reduced to 10 fish daily with no more than 2 fish over 20 inches. Possession limit has remained at two daily bag limits.

Cutthroat Management Recommendations and Prescriptions

The proper management of wild anadromous and resident cutthroat populations In Southeast Alaska will require several different management approaches, depending upon the stream or area. Management of cutthroat in Southeast Alaska has not differientiated between the two forms. The anadromous fish and the resident forms have been considered one as far as regulations covering their harvest.

Research at Petersburg Creek and at Lake Eva showed that ease of access has a decided affect on the harvest rate for cutthroat. In has been demonstrated that once road access is created, the quality of trout angling declines. A good example of this is the "108 Creek" system on Prince of Wales Island. Prior to the establishment of a logging camp at the stream mouth, "108 Creek" was considered an excellent cutthroat stream. After more than 12 years of easy access and heavy pressure, "108 Creek" no longer supports much of a cutthroat run.

In order to identify systems when dealing with other land use agencies, the Sport Fish Division has attempted to categorize the various cutthroat systems in Southeast Alaska. It has been decided that the best management for some systems would be to place them :in categories. These quality watershed categories were further broken down into "first", "second" and other categories.

Cutthroat systems falling within the classification constitute the best of the best and they have been recommended for restrictive management prescriptions. These prescriptions call for limited access and lack of timber harvest, road building, and other development. The cutthroat fishery would then be managed on a sustained yield basis for wild fish. In the future it may not be possible to retain this type of mangement for all systems, as the Forest Service has the final say on land use activities in most areas of Southeast Alaska. A listing of the "first" quality watersheds can be found in Appendix D.

Cutthroat systems in the "second" quality watersheds category do not rate as high as the "first" systems due to a variety of reasons. Some of these systems do not contain large populations of cutthroat, some have not been developed to any degree, and some have had or are receiving impacts from timber harvesting. Management prescriptions for these systems will allow some land use activities while working closely with the Forest Service to insure minimal disruption of the cutthroat habitat during land use activities. Listings of these systems can be found in Appendix D.

The remainder of the cutthroat systems in Southeast Alaska that do not fall into one of the two above categories are recommended for less restrictive management prescriptions. These remaining systems are not normally considered top quality due mainly to the low numbers of cutthroat, small stream size, or their degradation due to the activities of man. Many of the systems found in this category have good potential for enhancement programs and other management practices. A list of these watersheds also appears in Appendix D.

Future management prescriptions for Southeast Alaska cutthroat will incorporate prescriptions mentioned above and will include but not be limited to the following three:

Mail Surveys:

A statewide survey of randomly selected sport fish license holders is presently under way. Results of this survey for angling in Southeast Alaska should be available in early 1978. This marks the first attempt to gain management data from this form of survey. Evaluation of the responses will add a great deal of knowledge on the utilization of sport fish resources of Southeast and should identify where effort is occurring and give direction for best forms of future management.

Creel Census:

The use of creel census as a management prescription is useful only for specific systems. To be effective, a creel census requires a considerable amount of time and effort. However, it is an excellent management method of obtaining needed information about the harvest of cutthroat on a system by system basis.

Creel census of anadromous cutthroat anglers for a large area is not practical at this time due the widespread nature of the anadromous cutthroat fishery and the lack of manpower and funds. Voluntary creel census programs have been tried in the past without much success. A census program of anglers using Forest Service cabins shows promise of being a useful tool for obtaining catch data from the many cutthroat fisheries scattered throughout Southeast.

Special Regulations:

The use of special regulations on a system by system basis or for a small geographic area have not as yet been used for cutthroat management in Southeast Alaska.

Special regulations can take the form of a reduced bag and possession limit, partial or total stream closures or the limiting of access or fishing methods. Special regulations will be most useful in the management of the anadromous cutthroat fishery and for certain land locked trophy cutthroat lakes.

Fisheries recommended for the use of special management regulations are as follows:

Anadromous cutthroat: Anadromous cutthroat as stated earlier are not overly abundant in any one stream system, arid recent increases in angling effort have reduced their numbers. It is recommended that the following regulations be adopted: (1) bag and possession limit for anadromous cutthroat be reduced to four per day, with a possession limit of two daily bag limits and (2) bag limit may not contain more than one cutthroat over 20 inches in length. Anadromous cutthroat would be defined as those fish residing in a stream that flows into salt water.

Resident Cutthroat: Southeast Alaska contains many lakes that harbor populations of cutthroat where individual fish rarely exceeding 400 mm (16 inches) while other lakes have many cutthroat that go over 500 mm (20 inches). Resident cutthroat over 20 inches are almost always in excess of 10 years of age. Heavy exploitation of the old fish will deplete their numbers in short order. Until future research can show otherwise, it is recommended that the following special regulations be enacted. Bag limit for resident cutthroat should be reduced to six fish daily of which only one trout may exceed 20 inches in length with a possession limit of two bag limits. Resident cutthroat should be defined as a cutthroat residing in a lake. There will be some overlap in some systems as there are both resident and sea-run cutthroat residing in lakes and streams at the same time; however, the overlap occurs most often during the winter months when angling pressure is light. It is also recommended under special regulations that portions of certain streams be closed during the spawning run when it has been determined that to leave them open would endanger the spawning populations of both anadromous and resident cutthroat.

Cutthroat Research in Southeast Alaska

Anadromous Cutthroat:

Management of anadromous cutthroat stocks in Southeast Alaska requires a considerable amount of data. Some data is now available; however, information is lacking for the majority of the cutthroat systems. To gain adequate management data, research will be required on a number of key systems within the next few years.

This research will most Likely take the form of the assessment of numbers of sea-run cutthroat together with the assessments of rearing habitat. The assessment of the numbers of adult sea-run cutthroat in any system is difficult, expensive and time consuming. The only reliable

survey method now developed is the use of a counting weir. This method is limited by its permanent nature, its expense, and the fast that answers are obtainable for only one system at a time. A technique needs to be developed to estimate cutthroat populations. Just what form this takes must still to be worked out and tested.

Techniques for determination of the annual harvest of sea-run cutthroat need to be developed. Results of the ongoing statewide mail survey may provide the answers necessary; however, a region wide mail survey may be necessary from time to time to determine current harvest.

Resident Cutthroat:

The total number of resident cutthroat found in the lakes of Southeast Alaska is mostly unknown. Surveys to date have not been uniform and have been useful only for determining species composition. Techniques need to be developed to capture, mark and release resident cutthroat so that a statistically sound evaluation of standing crop can be determined.

Research should continue for both sea-run and resident cutthroat spawning and rearing habitat requirements. Data provided by this research will give the management biologist the tools and information necessary to make decisions and recommendations when dealing with land use agencies.

Cutthroat Intra and Inter Stream Movement

Research on sea-run cutthroat at Petersburg Creek during the years 1971 through 1975 turned up a fact that part of the fall in-migration of cutthroat was composed of fish not tagged at the Petersburg Creek weir (Jones, 1977). The origin of these in-migrant cutthroat was not known; however, it was suspected that they came from populations in non-lake streams in the area. To determine the validity of this assumption, tagging studies initiated in 1975 were continued during the summer of 1977. Seven non-lake streams in the Petersburg area were selected (Table 1) which were all known to contain populations of anadromous cutthroat. Tagging of cutthroat began in July and continued through September 1977.

Duncan Salt Chuck:

Duncan Salt Chuck, located at the head of Duncan Canal, Kupreanof Island, (Figure 1), has long been noted for the abundance of sea-run cutthroat.

Duncan Salt Chuck was selected as one of the cutthroat tagging sites for the study of the intra and inter stream movement of cutthroat when it was determined that cutthroat tagged at Petersburg Creek were recaptured at the Salt Chuck (Jones, 1975).

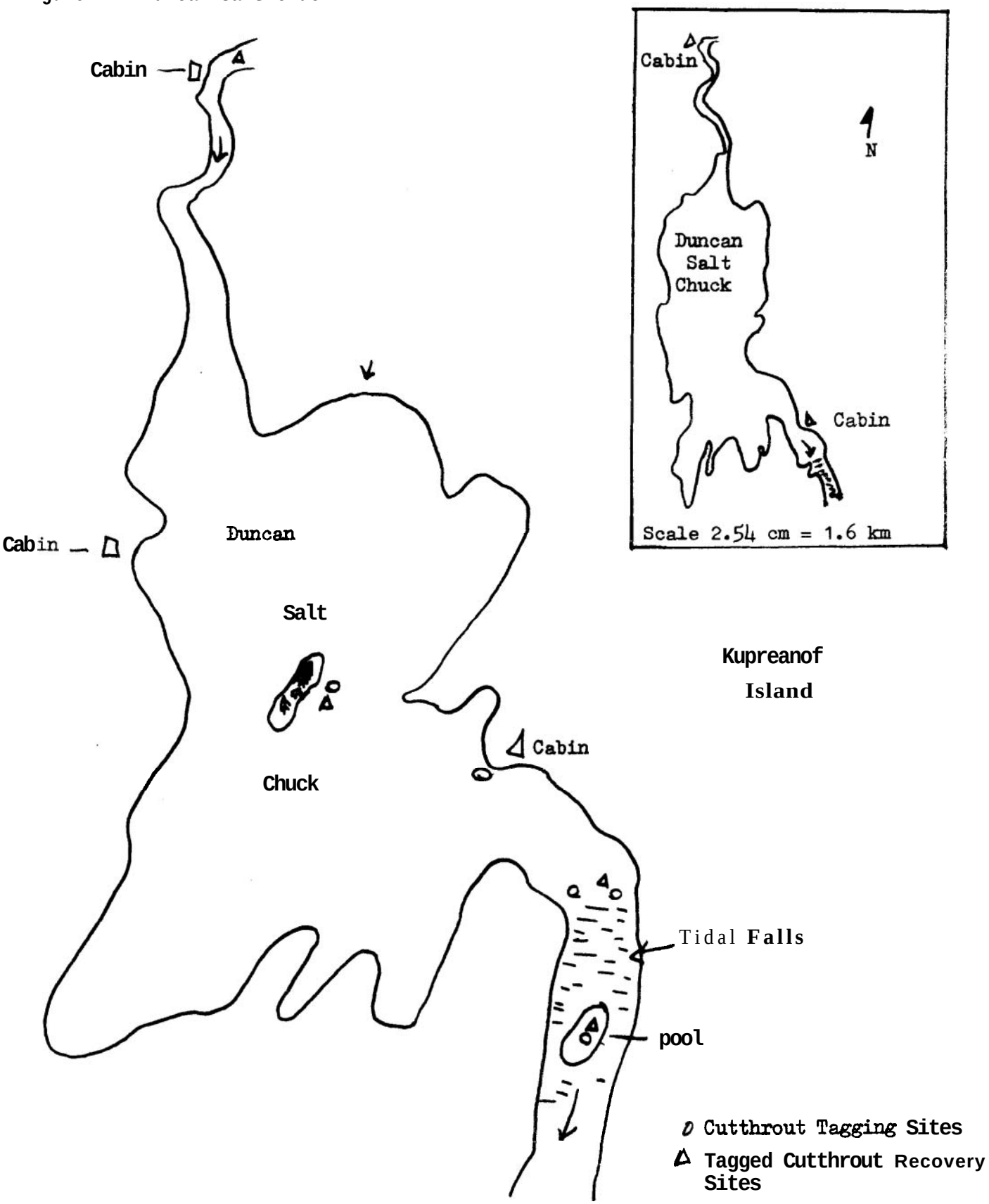
Schools of cutthroat are normally found moving in and out with the tide at the Salt Chuck feeding on sticklebacks, salmon fry and other marine organisms.

Tagging efforts utilizing hook and line were concentrated in this lower intertidal area beginning in 1975 and continuing through 1977. During this period a total of 168 cutthroat were captured, tagged, measured and released.

Table 1. Sea-Run Cutthroat Tagging Sites Petersburg Area 1975-1977

Stream	Location	No. of Cutthroat Tagged 1975	1976	1977
Duncan Salt Chuck	Kupreanof Island	86	24	57
Castle River	Kupreanof Island	17	7	107
Big Creek	Mitkof Island	51	17	10
Twelvemile Creek	Kupreanof Island	4	4	8
Fivemile Creek	Kupreanof Island	8	17	10
Blind Slough	Mitkof Island	2	-	-
Portage Bay Creek	Kupreanof Island	-	-	12
	'Totals	168	69	204

Figure 1. Duncan Salt Chuck



Recapture of tagged cutthroat were made by the angling public and project personnel. A total of six cutthroat were recaptured during 1977. Five of these fish had been tagged during 1977 and the remaining cutthroat had been tagged in 1975. All recaptures were made in the same general area where the fish were initially tagged, with the exception of one fish that was recaptured further upstream.

Castle River:

Castle River, located in mid Duncan Canal, Kupreanof Island, (Figure 2) is one of the major producers of sea-run cutthroat in the Petersburg area.

The study of the movement of cutthroat from Castle River to other systems in the area was begun with tagging of cutthroat on the tidal flats and in the lower river. Since 1975 a total of 131 cutthroat were captured on hook and line, tagged, and released back into Castle River.

Of the 131 tagged cutthroat, a total of seven have been recaptured to date. Recapture locations have been either in the area of tagging or in upstream areas of Castle River.

Big Creek:

Big Creek, located on the east side of Mitkof Island (Figure 3), was selected for study of the movement of cutthroat due to its close proximity to Petersburg Creek and also because it lacks a lake for the overwintering of anadromous cutthroat.

Big Creek has been noted for its excellent sea-run cutthroat angling near the intertidal area during the salmon runs and it was in this area that tagging efforts were located. As Big Creek has no overwintering sites it was believed that cutthroat from this sytem would be found overwintering in other streams. Tagging was begun in 1975 and continued through 1977 with a total of 78 cutthroat tagged and released.

A total of five cutthroat tagged at Big Creek have been recovered by local fishermen. Three of the tags were recovered from fish the same year they were tagged in approximately the same location. One cutthroat tagged at Big Creek was recovered 3 1/2 months later in the upper area of Blind Slough. The other tag recoveries came at Petersburg Creek. Both of these tag recoveries were made in late fall indicating that the cutthroat were headed for overwintering areas in Blind Slough and Petersburg Creek.

Fivemile and Twelvemile Creek:

Fivemile and Twelvemile creeks, located on the eastern side of Kupreanof Island (Figures 4 and 5) were used to determine the movement of cutthroat in the Petersburg area.

Both stream systems lack anadromous lakes and do not appear to have areas capable of overwintering large numbers of cutthroat. Both systems do support populations of sea-run cutthroat in the intertidal zone during

Figure 2. Castle River Flats

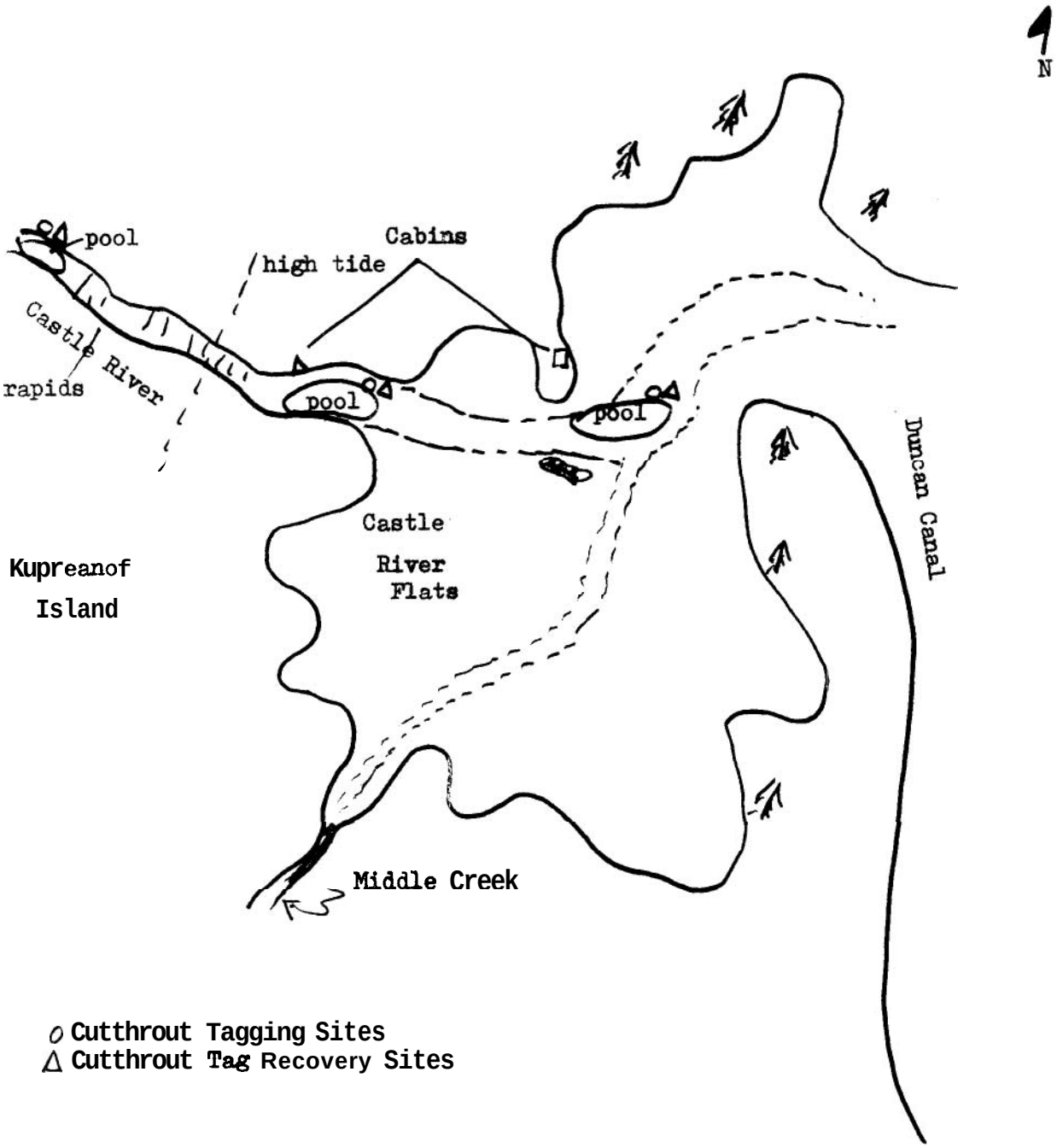


Figure 3. **Big Creek Cutthroat Tagging Sites**

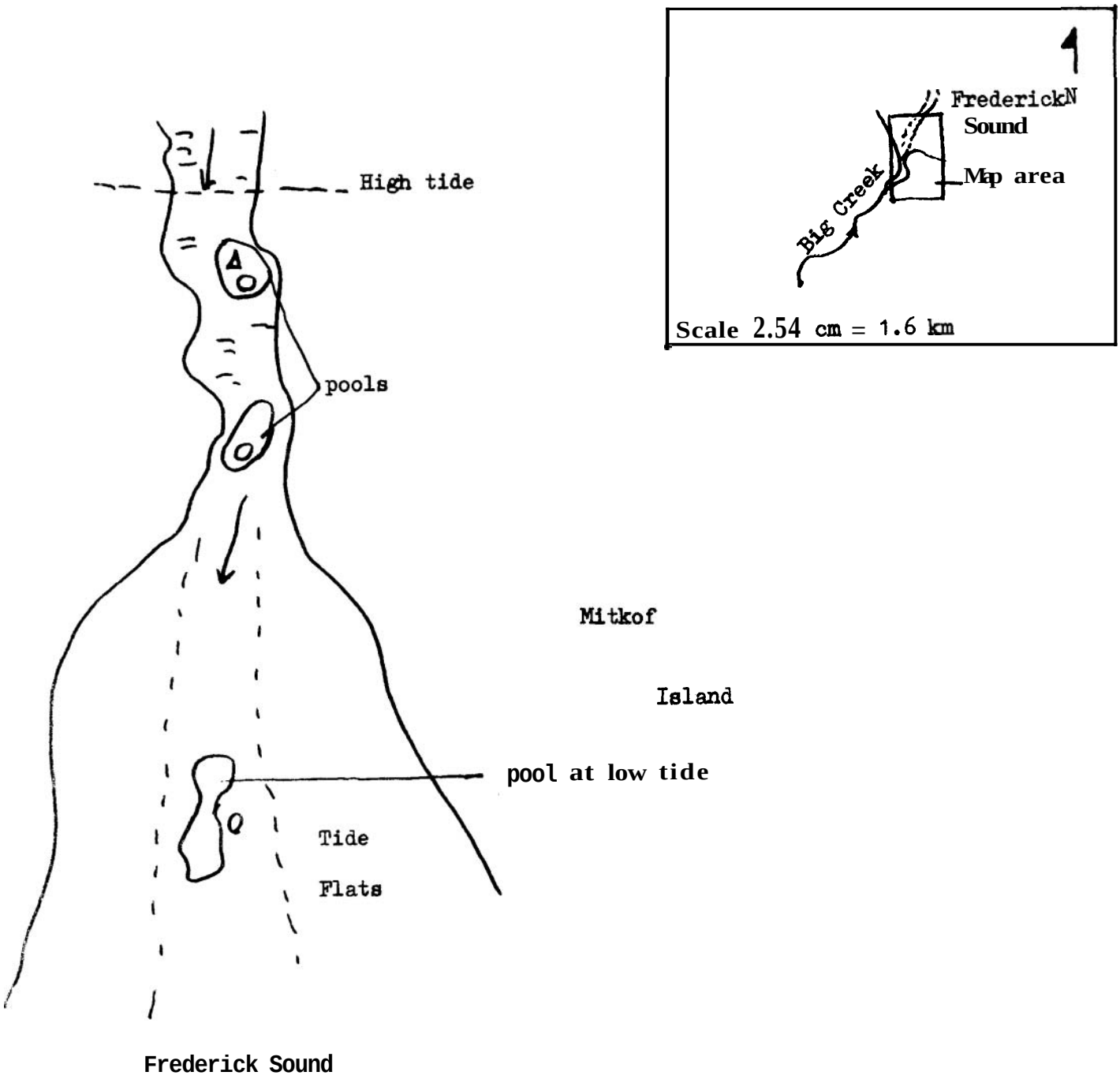
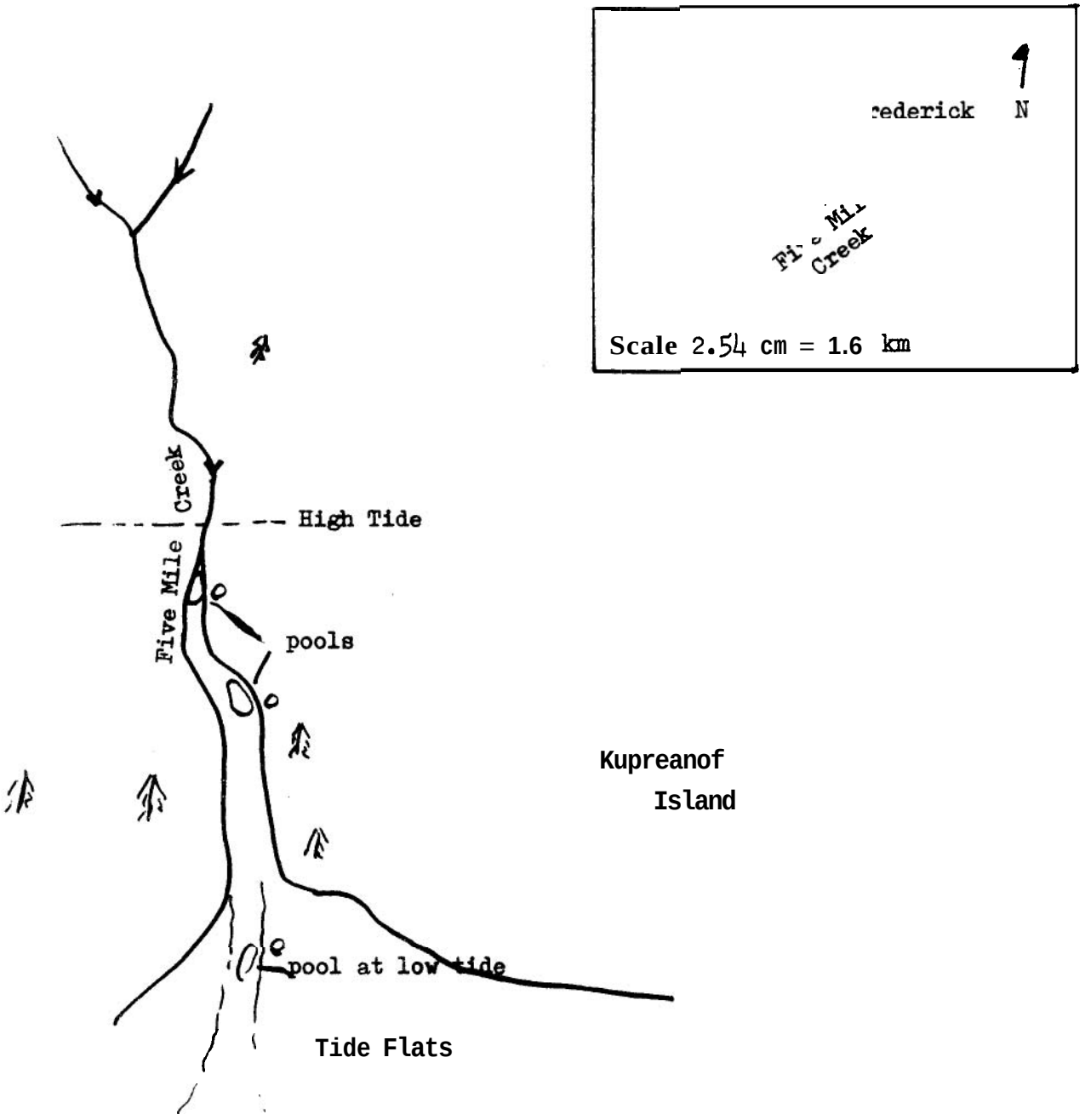
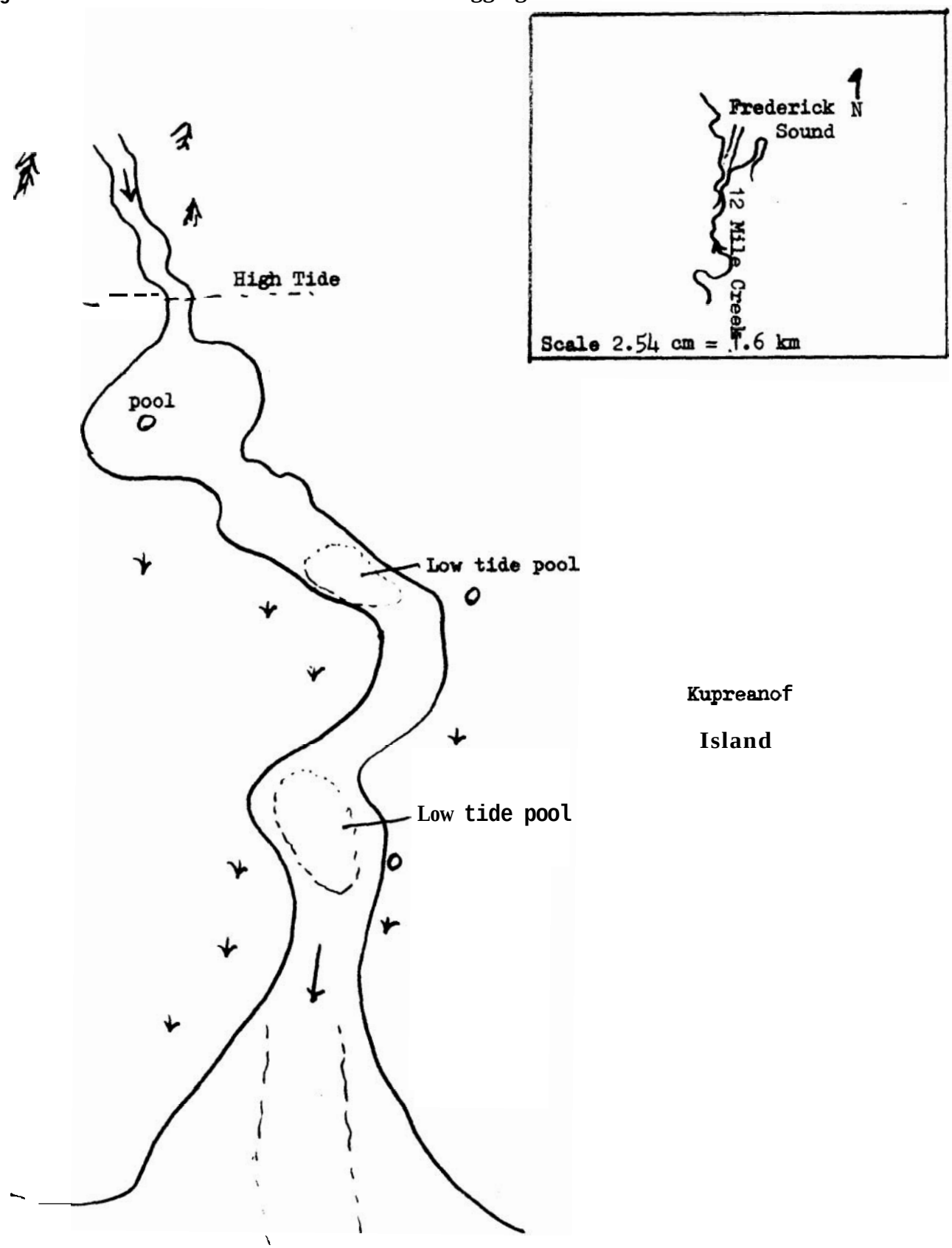


Figure 4. Fivemile Cutthroat Tagging Sites



o Cutthrout Tagging Sites

Figure 5. Twelvemile Creek - Cutthroat Tagging Sites



salmon runs, and efforts were made to determine the movement of these cutthroat.

Tagging of sea-run cutthroat was carried out at both Fivemile and Twelvemile creeks from 1975 through 1977. A total of 35 trout were tagged at Fivemile and a total of 16 were tagged at Twelvemile Creek. No tag recoveries were made from these cutthroat probably because of the small number that were tagged.

Portage Creek:

Portage Creek, located at the head of Portage Bay, Kupreanof Island, (Figure 6), was also selected for the study of cutthroat movements. Portage Creek was selected as the northernmost study stream as it has been determined from earlier work (Jones, 1977) that cutthroat from a local area do not normally travel over 60 kilometers to feed.

Tagging was undertaken at Portage Creek for the first time in 1977 in an effort to determine if the above findings were true. A total of 12 cutthroat were tagged on two separate tagging trips. On the second trip, one cutthroat that had been tagged earlier in the summer was recovered in the same location where it had been tagged. No tagged cutthroat from other systems were noted at Portage Creek.

Petersburg Creek:

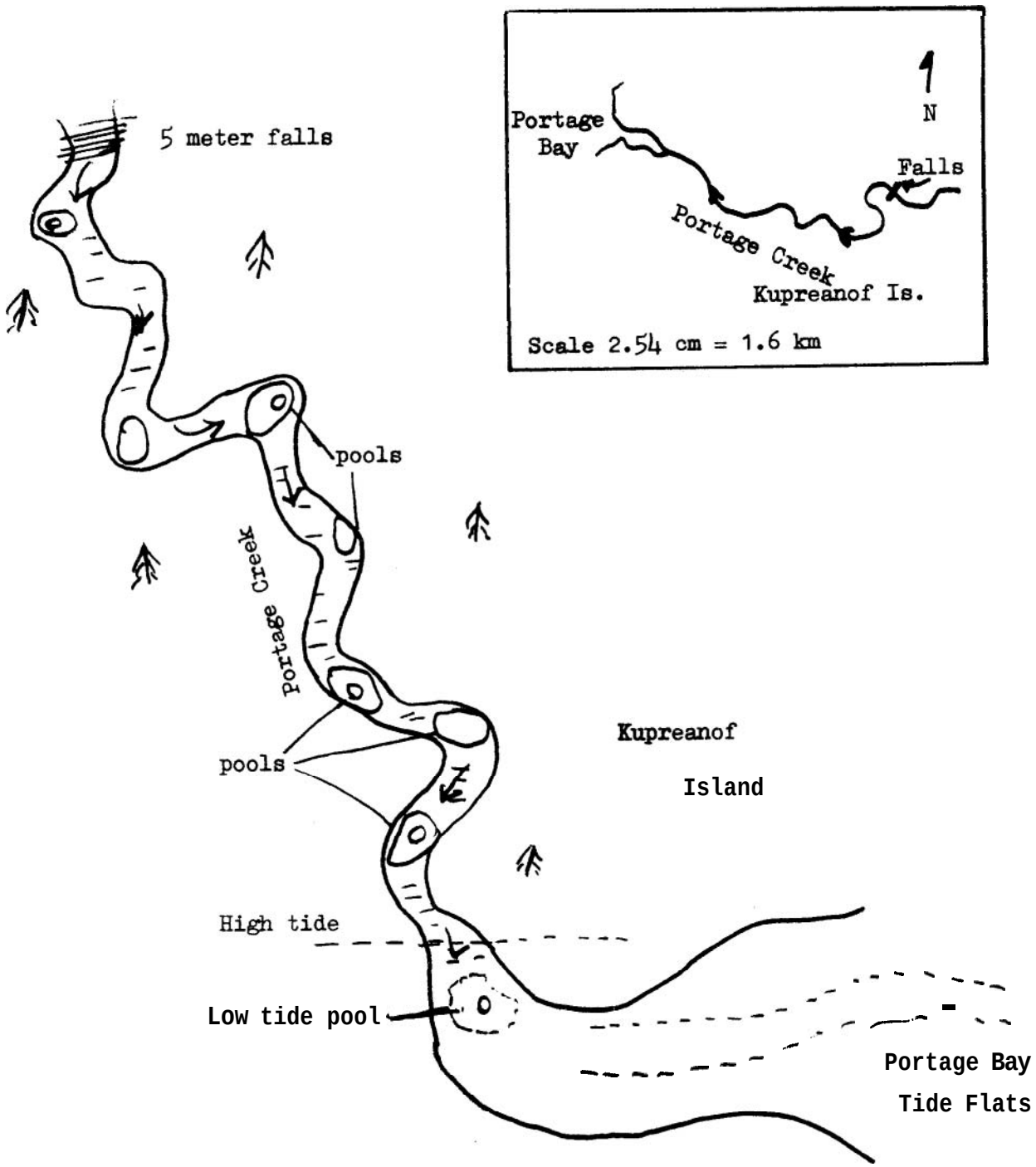
Petersburg Creek, located across Wrangell Narrows from Petersburg, was used as the test stream for the study of cutthroat movemen .

Studies during previous years have established the fact that sea-run cutthroat use the Petersburg Creek-Lake system as a wintering area.

Petersburg Creek is fished frequently by a considerable number of fishermen which aids in the recovery of tagged cutthroat. Records have been kept since the inter and intra stream movement study began in 1975 and a total of 23 tagged cutthroat have been recovered from Petersburg Creek. Many of these cutthroat were fish that had been tagged as part of the life history study; however, mixed in with all these recoveries were fish that had been tagged at Big Creek, Mitkof Island.

Even though there has not been a great number of tag returns, it is apparent that there is some movement between systems in the Petersburg area. The intertidal area of Duncan Salt Chuck is primarily a feeding area for sea-run cutthroat. The wintering areas for these fish may be in lower Duncan Salt Chuck Creek or in the chuck itself. This remains to be determined. Tag returns from Castle River suggest that this is a homogenous population of cutthroat that move out to the tidewater areas to feed during the summer but return to wintering areas in Castle River in the late fall. Cutthroat from Big Creek have been recovered in Blind Slough and Petersburg Creek which suggests that Big Creek lacks over-intering areas and that the sea-run population found at Big Creek seeks

Figure 6. Portage Creek - Cutthroat Tagging Sites



o Cutthrout Tagging Sites

other systems for the winter. Even though tag recoveries have not been collected, it would seem logical that sea-run cutthroat from Fivemile and Twelvemile creeks also overwinter in other systems.

DISCUSSION

From background informatio gathered at Petersburg Creek and other streams, it is apparent that to adequately manage and enhance the sea-run and resident cuttroat populations in Southeast Alaska, a comprehensive plan must be formulated. This plan will define where the problem areas are and will provide methods and means for solving most management problems.

The management and enhancenent plan will not be cast in concrete but will remain flexible to eneble the addition of new data, ideas and techniques for the management and enhancement of cutthroat in Southeast Alaska. Information gathered to date for this plan has been presented in this report.

The inter and intra stream movement of sea-run cutthroat has been a management problem for Fish and Game agencies throughout the Pacific Northwest. Sea-run cutthroat do not appear to follow a definite pattern during their time at sea, but go off in the direction of the greatest food supply or for other as yet undetermined reasons. This erratic movement from place to place without a set of ground rules makes management of a given stream or trea somewhat difficult. This erratic behavior will also make enhancement of any given stream more difficult. It does appear that cutthroat from a small geographical area do tend to remain in that area and may dictate that management be carried out by area rather than on single stream basis.

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APPENDIX A

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APPENDIX B

Cutthroat streams listed in Appendix B have been cataloged by geographic regions and are generally listed in order from north to south in each region. Some streams listed under each region have been reported to contain a population of sea-run cutthroat, however, these populations have not been confirmed to date. These unconfirmed populations are noted at the bottom of each survey sheet.

The geographic regions for cutthroat streams in Southeast Alaska are as follows:

Yakutat - The mainland from Yakutat Bay to the southern boundary of Glacier Bay National Monument.

Taku - The mainland from Glacier Bay National Monument to the Stikine River.

Stikine-Unuk - The mainland from the Stikine south to Portland Canal.

Chichagof - All cutthroat streams on Chichagof and Yakobi Islands.

Baranof - All cutthroat streams on Baranof Island.

Admiralty - All cutthroat streams on Admiralty Island.

Kupreanof - All cutthroat streams on Kupreanof and Mitkof islands.

Kuiu - All cutthroat streams on Kuiu Island.

Wrangell - All cutthroat streams on Wrangell and Etolin Islands.

Prince of Wales - All cutthroat streams on Kosciusko, Prince of Wales and Dall Islands.

Revillagigedo - All cutthroat streams on Revillagigedo Island.

YAKUTAT

Stream	Location	
	Latitude	Longitude
Lost River	59°25'N	139°40'W
Humpback Creek	59°41'N	139°31'W
Seal Creek	59°25'N	139°25'W
Italio River	59°16'N	139°W
Akwe River	59°15'N	138°55'W
East Alsek River	59°5'N	138°30'W
Doame River	59°5'N	138°20'W
Bartlett River	58°28'N	135°50'W
Salmon River	58°25'N	135°42'W

TAKU

Stream	Location	
	Latitude	Longitude
Chilkat River	59°15'N	135°33'W
Berners River	58°51'N	134°56'W
Windfall Creek	58°31'N	134°45'W
Peterson Creek	58°27'N	134°45'W
Mendenhall River	58°20'N	134°30'W
Taku River		
Crystal Creek	56°53'N	132°42'W

STIKINE - UNUK

Stream	Location	
	Latitude	Longitude
Stikine River	56°30'N	132°20'W
Crittenden Creek	56°30'N	132°16'W
Martin Creek	56°14'N	131°50'W
Tom Creek	56°13'N	131°43'W
Eagle River	56°11'N	131°35'W
Anan Creek	56°10'N	131°52'W
Black Bear Creek	55°42'N	132°10'W
Helm Creek	55°30'N	131°56'W
Wolverine Creek	55°55'N	131°50'W
Hulakon River	56°8'N	131°5'W
Unuk River	56°8'N	131°6'W
Checats Creek	55°28'N	130°52'W
Wilson River	55°25'N	130°38'W
Blossom River	55°28'N	130°38'W
Bakewell Creek	55°18'N	130°37'W

STIKINE - UNUK (cont.)

Stream	Location	
	Latitude	Longitude
Humpback Creek	55°2'N	130°40'W
Fillmore Creek	54°56'N	130°27'W

CHICHAGOF

Stream	Location	
	Latitude	Longitude
Sitkoh Creek	57°32'N	134°58'W
Kadashan Creek	57°44'N	135°12'W
Pavlof River	57°50'N	135°2'W
Goulding River	57°48'N	136°15'W

BARNOF

Stream	Location	
	Latitude	Longitude
Salmon Creek	56°58'N	135°10'W
Eva Creek	57°24'N	135°6'W

ADMIRALTY

Stream	Location	
	Latitude	Longitude
Hasselborg River	57°35'N	134°20'W
Kanalku Creek	57°28'N	134°22'W

KUPREANOF

Stream	Location	
	Latitude	Longitude
Hamilton River	56°53'N	133°42'W
Castle River	56°38'N	133°18'W
Kah Sheets Creek	56°31'N	133°10'W
Totem Bay Creeks (3)	56°31'N	133°25'W
Tunehean Creek	56°36'N	133°38'W
Duncan Salt Chuck	56°55'N	133°19'W

KUPREANOF (cont.)

Stream	Location	
	Latitude	Longitude
Portage Creek	56°37'N	133°15'W
Petersburg Creek	56°46'N	133°6'W
Blind Slough	56°36'N	132°50'W
Big Creek (Bear Creek)	56°42'N	132°40'W

KUIU

Stream	Location	
	Latitude	Longitude
Kadake Creek	56°46'N	133°58'W
Kutlaku Creek	56°38'N	134°9'W
Alecks Creek	56°31'N	134°4'W

WRANGELL

Stream	Location	
	Latitude	Longitude
Olive Creek	56°11'N	132°18'W
Hatchery Creek	56°3'N	132°24'W
Streets Creek	56°6'N	132°36'W
Kunk Creek	56°17'N	132°25'W
Thoms Creek	56°12'N	132°10'W

PRINCE OF WALES

Stream	Location	
	Latitude	Longitude
Sutter Creek	56°8'N	133°26'W
Shipley Creek	56°6'N	133°30'W
Trout Creek	56°4'N	133°42'W
Salmon Bay Creek	56°18'N	133°10'W
Red Bay Creek	56°16'N	133°19'W
Sarkar System	55°58'N	133°18'W
Staney Creek	55°46'N	133°10'W
Exchange Creek	56°11'N	133°6'W
"108" Creek	56°8'N	133°8'W
Eagle Creek	55°56'N	132°46'W
Thorne River	55°42'N	132°36'W

PRINCE OF WALES (cont.)

Stream	Location	
	Latitude	Longitude
Karta River	55°35'N	132°36'W
Hatchery Creek	55°55'N	132°55'W
Log Jam Creek	55°55'N	132°58'W
Klawak River	55°33'N	133°4'W
Harris River	55°28'N	132°41'W
Bear Creek	55°36'N	132°55'W
Hydaburg River	55°14'W	132°50'W
Klakas Creek	55°4'N	132°23'W
Miller Creek	55°7'N	132°14'W
Kegan Creek	55°1'N	132°9'W

REVILLAGIGEDO

Stream	Location	
	Latitude	Longitude
Naha River	55°35'N	131°35'W
Ward Creek	55°25'N	131°45'W
Fish Creek	55°25'N	131°12'W
White River	55°26'N	131°34'W
Traitor's Creek	55°50'N	131°30'W

APPENDIX C.

APPENDIX C.

Cutthroat lakes listed in Appendix C have been cataloged by geographic regions and are generally listed in order from north to south in each region. Many lakes remain to be surveyed throughout Southeast Alaska and new populations of cutthroat will be added to this file.

The geographic regions for cutthroat lakes in Southeast Alaska are as follows:

Yakutat - The mainland from Yakutat to the southern boundary of Glacier Bay National Monument.

Taku - The mainland from Glacier Bay National Monument to the Stikine River.

Stikine-Unuk - The mainland from the Stikine River south to Portland Canal.

Chichagof - All cutthroat lakes on Chichagof and Yakobi Islands.

Baranof - All cutthroat lakes on Baranof Island.

Admiralty - All cutthroat lakes on Admiralty Island.

Kupreanof - All cutthroat lakes on Kupreanof, Kuiu, Mikof and Woewodski Islands.

Wrangell - All cutthroat lakes on Wrangell and Etolin Islands.

Prince of Wales - All cutthroat lakes on Prince of Wales, Kosciusko, Keceta and Dall Islands.

Revillagigedo - All cutthroat lakes on revillagigedo and Gravina Islands.

YAKUTAT

Lake	Location	
	Latitude	Longitude
Square Lake	59°13'N	138°43'W

TAKU

Lake	Location	
	Latitude	Longitude
Turner Lake	58°17'N	133°48'W
Mosquito Lake	59°28'N	136°2'W
Rustabach Lake	59°7 1/2'N	135°20'30"W
Chilkat Lake	59°22'N	135°56'W
Windfall Lake	58°55'N	134°45'W
Brown Cove *(Unofficial)	56°54'N	132°45'W

STIKINE-UNUK

Lake	Location	
	Latitude	Longitude
North Arm Lake *(unofficial)	56°41'N	132°26'W
Twin Lakes		
Barnes Lake	56°42'N	131°54'W
Virginia Lake	56°28'N	132°10'W
Martin Lake	56°17'N	131°52'W
Lower Harding *(unofficial)	56°14'N	131°40'W
Eagle Lake	56°2'N	131°27'W
Boulder Lake	56°15'N	131°45'W
Anan Lake	56°13'N	131°53'
Bear Lake	55°40'N	132°06'26"W
Helen Lake	55°58'16"N	131°56'05"W
Helm Lake	55°38'01"N	131°56'15"W
Woodpecker Lake	55°56'57"N	131°46'11"W
Hofstad Lake	55°45'0"N	132°0'46"W
McDonald Lake	55°57'42"N	131°50'11"W
Reflection Lake	56°1'51"N	131°35'18"W
Scout Lake	55°42'7"N	132°01'36"W
Three Islands Lake *(unofficial)	55°42'54"N	132°13'26"W
Wasta Lake	55°51'14"N	131°55'50"W
Woodpecker	55°56'57"N	131°46'11"W
Winstanley Lake (2)	55°25'0"N	130°51'15"W
Wilson Lake	55°30'38"N	130°33'49"W
Very Inlet	55°56'50"N	130°49'56"W

W

STIKINE-UNUK (cont.)

Lake	Location	
	Latitude	Longitude
Sykes Lake	55°09'0"N	131°0'0"W
Shrew - Fillmore Inlet	54°59'8"N	130°27'48"W
Robinson Lake	55°55'0"N	131°01'54"W
Sak's Lake	55°58'7"N	131°00"W
Reef Point (Freile)	55°5'0"N	131°16'42"W
Porky Lake *(unofficial)	55°14'40"N	130°45'14"W
Nakat Mountain Lake *(unofficial)	54°53'0"N	130°35'50"W
Nakat Lake *(unofficial)	55°11'24"N	130°42'48"W
Kah Shakes Lake	55°3'23"N	130°56'11"W
Humpback Lake		
Hidden Inlet	54°59'21"N	130°24'16"W
Hugh Smith Lake	55°5'44"N	130°34'43"W
Gene's Lake	56°13'08"N	130°52'45"W
Cobb Lake	55°3'8"N	130°38'32"W
Lower Checats	55°28'7"N	130°52'5"W
Cabin Creek	55°20'24"N	131°45'0"W
Bakewell Lake	55°15'18"N	130°41'0"W
Badger Lake	55°13'4"N	130°46'28"W
Upper Gold Standard *(unofficial)	55°38'42"N	132°1'47"W
Lower Gold Standard *(unofficial)	55°38'54"N	132°0'39"W

CHICHAGOF

Lake	Location	
	Latitude	Longitude
Surge Lake	58°00'10"N	136°31'30"W
Sitkoh Lake	57°30'30"N	135°05'W
Goulding Lake #1	57°48'N	136°13'W
Goulding Lake #2	57°48'N	136°11'W
Goulding Lake #3	57°48'N	136°08'W
Goulding Lake #4	57°48'N	136°05'W
Ford Arm Lake *(unofficial)	57°36'N	135°53'W
Unnamed (Section 22)	57°21'N	135°36'W

BARANOF

Lake	Location	
	Latitude	Longitude
Baranof Lake	57°05'N	134°51'W
(Unamed) Paddy Lake	57°15'45"N	135°29'30"W
Buck Lake		
Little Lake Eva	57°23'N	135°02'W

BARANOF (cont.)

Lake	Location	
	Latitude	Longitude
Unamed (Section 15)	47°22'N	135°35'W
Salmon Lake	56°58'N	135°09'W
Sadie Lake	57°05'N	134°45'W
Unnamed (Banks Lake)	56°33'N	134°59'W

ADMIRALTY

Lake	Location	
	Latitude	Longitude
Youngs Lake	58°7'N	134°28'W
Thayer Lake	57°44'N	134°44'W
Distin Lake	57°37'N	134°18'W
Hasselborg Lake	57°42'N	134°16'W
Kanalku Lake	57°29'N	134°21'W
Davidson Lake	57°37'N	134°18'W
McKinney Lake (Brownie)	57°40'N	134°16'W

KUPREANOF

Lake	Location	
	Latitude	Longitude
Cool Lake	56°50'N	134°15'W
Alecks Lake	56°32'N	134°2'W
Bohemian Lake	56°55'N	133°28'W
Petersburg Lake	56°53'N	133°10'W
Kah Sheets Lake	56°33'N	133°12'W
Kushneaheen Lake (Barrie)	56°30'N	133°31'W
Kalinia Lake *(unofficial)	56°43'N	133°28'W
Irish Lake	56°42'N	133°31'W
Towers Arm	56°53'N	133°29'W
Kutlaku Lake	56°38'N	134°9'W
Colp Lake	56°53'N	133°01'W
Harvey Lake	56°33'N	133°2'W

WRANGELL

Lake	Location	
	Latitude	Longitude
Trout (Pat) Lake	56°21'N	132°20'W
Crane Lake	56°39'N	132°40'W
Burnett Lake	56°7'N	132°26'W
Kunk Lake	56°17'N	132°25'W
Thoms Lake	56°14'N	132°15'W

PRINCE OF WALES

Lake	Location	
	Latitude	Longitude
Andersen Lakes (2)	55°33'50"N	132°48'51"W
Welcome Lake	54°58'53"N	133°7'12"W
Angel Lake	55°40'18"N	132°38'6"W
Brownson Lake *(unofficial)	54°45'08"N	132°15'08"W
Dora Lake	55°10'N	132°15'W
Chuck Lake	54°46'29"N	133°27'48"W
Eek Lake (2)	55°10'35"N	132°40'30"W
Hetta Lake	55°10'38"N	132°32'37"W
Johnson Cove	55°05'17"N	132°05'36"W
Stone Rock *(unofficial)	54°48'N	132°01'11"W
Karta Lake (Little Salmon)	55°34'N	132°38'W
Sukkwan Lake	55°2'18"N	132°45'39"W
Sutter Lakes	56°8'N	133°26'W
Thorne Lake	55°46'4"N	132°46'11"W
Wolf Lake	55°32'03"N	132°36'22"W
Neck Lake	56°6'N	133°10'W
Twin Island	56°10'N	133°12'W
Kasook Island	55°3'15"N	132°49'42"W
Klakas Lake	55°1'34"N	132°21'29"W
Klawak Lake	55°30'40"N	132°57'44"W
Long Lake *(unofficial)	55°55'N	133°12'W
Miller Lake	55°8'37"N	132°13'38"W
Monie Lake	55°19'24"N	132°10'28"W
Nichols Lake	54°45'26"N	132°11'25"W
Old Frank's Lake	55°26'31"N	132°31'47"W
Paul Lake	55°8'33"N	132°5'0"W
Tammy Lake *(unofficial)	55°59'N	133°13'W
Sutter Lakes	56°8'N	133 26'W
Sweetwater Lake	55°58'N	132°57'W
Sarkar Lake	55°56'N	133°14'W
Shipley Lake	56°6'N	133°27'W
Salmon Bay Lake	56°15'N	133°12'W

PRINCE OF WALES (cont.)

Lake	Location	
	Latitude	Longitude
Red Lake	56°15'N	133°19'W
Moss Lake *(unofficial)	56°55'N	133°12'W
Hatchery Lake	55°54'N	132°56'W
Galea (Honker) Lake	55°50'N	132°53'W
Finger Lake *(unofficial)	55°57'N	133°6'W
Cavern Lake	56°10'N	133°10'
Ratz Lake	55°51'47"N	132°33'40"W
St. Nicholas Lake	55°25'34"N	132°54'39"W
Salmon Lake	55°34'30"N	132°40'43"W
Essowah Lake	54°47'15"N	132°52'16"W
Devil Lake	55°0'28"N	133°6'44"W

REVILLAGIGEDO

Lake	Location	
	Latitude	Longitude
Little Bostwick Lake	55°18'16"N	131°44'21"W
Gravina #1 *(unofficial)	55°17'5"N	131°41'22"W
Gravina #2 *(unofficial)	55°18'57"N	131°40'50"W
Gravina #3 *(unofficial)	55°18'48"N	131°40'22"W
Big Bostwick Lake	55°19'24"N	131°44'38"W
Basin Lake	55°25'13"N	131°9'32"W
Big Lake	55°25'42"N	131°11'18"W
Chamberlain Lake	55°38'0"N	131°28'3"W
Connell Lake	55°25'57"N	131°39'43"W
Cubby Lake	55°17'31"N	131°26'7"W
Ella Lake	55°28'15"N	131°6'13"W
Emma Lake	55°37'15"N	131°32'48"W
Heckman Lake	55°34'48"N	131°31'40"W
Ingram Lake	55°26'47"N	131°38'34"W
Johnson Lake	55°20'10"N	131°20'45"W
Jordan Lake	55°36'2"N	131°33'23"W
Swan Lake	55°36'59"N	131°17'5"W
Third Lake	55°26'29"N	131°11'40"W
Ward Lake	55°24'43"N	131°41'54"W
Ketchikan Lake (Upper)	55°23'33"N	131°37'30"W
Ketchikan Lake (Lower)	55°22'15"N	131°37'41"W
Leask Cove #1	55°31'57"N	131°33'48"W
Long Lake	55°54'51"N	131°28'41"W
Low Lake	55°23'50"N	131°11'40"W
Mahoney Lake	55°25'18"N	131°31'16"W
Manzanita Lake	55°34'19"N	131°3'9"W
Margarita Bay Lake	55°41'4"N	131°35'39"W
Mesa Lake	55°23'40"N	131°7'30"W

Lake	Location	
	Latitude	Longitude
Mirror Lake	55°31'6"N	131°9'10"W
Moth Lake	55°17'5"N	131°20'50"W
Narrow Lake	55°18'15"N	131°21'04"W
Neets Lake	55°45'50"N	131°28'30"W
Orchard Lake	55°49'0"N	131°24'51"W
Otter Lake	55°18'14"N	131°20'29"W
Patching Lake	55°36'0"N	131°28'59"W
Wolf Lake (Upper)	55°32'01"N	130°35'43"W
Salt Chuck Lake	55°33'42"N	131°26'26"W
Shelter Cove #1	55°32'21"N	131°23'56"W
Shelter Cove #2	55°32'31"N	131°23'27"W
Snag Lake	55°17'59"N	131°26'36"W
Snipe Island Lake *(unofficial)	55°49'42"N	131°8'41"W

APPENDIX D

QUALITY WATERSHEDS

Quality Watersheds - Cutthroat - Southeast Alaska

First Quality Watersheds

Stream or Lake	Location
Turner Lake	Juneau - Mainland
Mud Bay Creek	Chichagof Island
Hasselborg-Thayer Systems	Admiralty Island
Goulding System	Chichagof Island
Lake Eva	Baranof Island
Castle River	Kupreanof Island
Duncan Salt Chuck	Kupreanof Island
Petersburg Creek	Kupreanof Island
Kadake Creek	Kuiu Island
Sweetwater-Thorne Systems	Prince of Wales Island
Sarkar Lakes	Prince of Wales Island
Naha River System	Revillagigedo Island
Karta River System	Prince of Wales Island

Second Quality Watersheds

Akwe River	Yakutat
Italio River	Yakutat
Square Lake	Yakutat
Chilkat Lake	Haines - Mainland
Chilkoot Lake	Haines - Mainland
Moose Lake	Juneau - Mainland
Windfall Creek	Admiralty Island
Kathleen Lake	Admiralty Island
Florence Lake	Admiralty Island

Stream or Lake	Location
Kook Lake	Chichagof Island
Sitkoh Lake	Chichagof Island
Suloia Lake	Chichagof Island
Baranof Lake	Baranof Island
Salmon Lake	Baranof Island
Alecks Lake	Kuiu Island
Towers Lake	Kupreanof Island
Kah Sheets Lake	Kupreanof Island
Ideal Cove Lakes	Mitkof Island
Virginia Lake	Wrangell - Mainland
Kunk Lake	Etolin Island
Olive Cove Creek	Etolin Island
Thoms Creek	Wrangell Island
Martin Lake	Wrangell - Mainland
Eagle River & Lake	Wrangell - Mainland
Red Bay Lake	Prince of Wales Island
Salmon Bay Lake	Prince of Wales Island
Black Bear Lake	Prince of Wales Island
Klawak Lake & River	Prince of Wales Island
Eek Lake	Prince of Wales Island
Hetta Lake	Prince of Wales Island
Miller Lake System	Prince of Wales Island
Klakas System	Prince of Wales Island
Dickman Bay	Prince of Wales Island
Kegan Lake	Prince of Wales Island

Stream or Lake	Location
Niblack System	Prince of Wales Island
Essowah System	Dall Island
Lake McDonald System	Ketchikan - Mainland
Unuk River	Ketchikan - Mainland
Helm Bay Lake	Ketchikan - Mainland
Manzanita Lake	Revillagigedo Island
Ella Lake	Revillagigedo Island
Low Lake	Revillagigedo Island
Bakewell Lake	Kechikan - Mainland
Hugh Smith System	Ketchikan - Mainland
Humpback Lake	Ketchikan - Mainland
Wilson Lake	Ketchikan - Mainland

Other Quality Watersheds

Windfall Lake	Juneau - Mainland
Mendenhall Lake	Juneau - Mainland
Shelter Island Lake	Shelter Island
Hamilton River	Kupreanof Island
Tuneheen Creek	Kupreanof Island
Ketili Creek - Barnes Lake	Stikine River
Kutlaku Lake	Admiralty Island
Kushneahin Lake	Kupreanof Island
Harvey Lake	Woewodski Island
Tom Lake	Wrangell - Mainland
Boulder Lake	Wrangell - Mainland
Streets Lake	Etolin Island

Stream or Lake	Location
Hatchery Lake	Etolin Island
Wasta Creek	Ketchikan - Mainland
Port Stewart Creek	Ketchikan - Mainland
Traitors Creek	Revillagigedo Island
White River	Revillagigedo Island
Eagle Creek - Luck Lake	Prince of Wales Island
Trocadero System	Prince of Wales Island
Winstanley Lake	Revillagigedo Island
Bostwick Lake	Ketchikan - Mainland
Shipley Lake	Kosciusko Island